

REMARKS

Status of Claims

Claims 1 – 20 were original in the application. Claims 12 and 17 – 20 have been cancelled. Claims 1, 3, 4, and 13 have been amended in this amendment. Claims 3, 4 and 13 – 16 have been indicated as including allowable subject matter if rewritten in independent form. Claims 1 – 11, and 13 -16 are submitted for examination on the merits.

Amendments to the Specification

A minor correction to dictation has been made to paragraph [0012] with no change in meaning.

Objections to the Claims

Claim 13 has been responsively amended.

Rejection Pursuant to 35 USC 102

Claims 1, 2, 5, 9 - 12 and 17 - 20 were rejected as being anticipated by Wu US Patent 5,448,581.

With regard to claims 1, 11 and 12, the Examiner contended that Fig. 1K of Wu shows a semiconductor resonator structure comprising:

a light transmissive substrate;

a guiding channel 12 defined in the substrate; and

at least two distributed gratings (15, 17) defined in the substrate surrounding the guiding channel 12 by at least two opposing sides of the guiding channel (col. 5 lines 20-21),

wherein either the period of each of the gratings or their refractive index or both are not constant (gratings by definition inherently include a longitudinally varying refractive index).

Wu discloses a conventional prior art Bragg ring resonator. The Bragg distributed gratings 15 and 17 show in Fig. 1K each have a regular or constant periodicity. Wu at col. 4, line 66 – col. 5, line 4, states:

“As shown in FIG. 1D the circular grating patterns 15, 17 are then transferred into the semi-insulating material by means of RIE. **The pitch of the gratings is selected in accordance with the previously set out formulae (1) and (2).** The grating has a symmetrical pattern i.e. the width of the grooves equals the width of the ridges. (emphasis added)

Formulae (1) and (2) are described at col. 1, line 66 – col. 2, line 10, which states:

“The pitch of the gratings is tailored to match the wavelength of the light generated by the laser according to the following formula:

$$\Lambda = \lambda / n \quad (1)$$

where Λ = pitch, λ = emission wavelength and n = index of refraction of the material. The above formula is for the second order grating; the first order grating having the following formula:

$$\Lambda = \lambda / 2n.” \quad (2)$$

The pitch, Λ , is clearly constant across the radial extent of the Bragg grating. Wu have been incorrectly characterized by where it is contended that the period of each of the gratings or their refractive index or both are not constant. While it is true that gratings by definition inherently include a longitudinally varying refractive index, what

Wu discloses is that the periodicity of the longitudinally varying refractive index is constant, i.e. the pitch of the gratings is constant and it also follows that the periodicity of the refractive index is constant.

As the disclosure of the invention discusses in great detail the constant periodicity of the prior art, as typified by Wu, is insufficient to provide adequate performance, namely a large free spectral range, FSR, with low bend losses and low material losses. The periodicity of the distributed gratings according to the invention is not constant as disclosed by Wu, but varies as illustrated in Fig. 11. The bottom straight line in Fig. 11 is the Bragg layer thickness, which is constant and hence has a constant period. The curved line in Fig. 11 is the optimal design of the invention in which the first number of Bragg layers have distinctly different thicknesses particularly in the first number of layers and only approach the constant Bragg thickness at high layer numbers. The nonconstant periodicity of the index of refraction of the invention is a little more difficult to graphically visualize, but is illustrated reasonably clearly in the graph of Fig. 12A. Claim 1 is a more generic statement of the more specific reasons recognized for allowance of claims 3, 4, and 13 – 16. The definition of claim 1 is also true of claims 3, 4, and 13 – 16 and does not define on Wu.


Thus, it cannot be maintained that each and every limitation of claim 1 is disclosed by Wu.

Claims 2, 5 - 9, 10, and 11 depend directly or indirectly on claim 1 and are allowable therewith and for such limitations as further introduced in the claims.

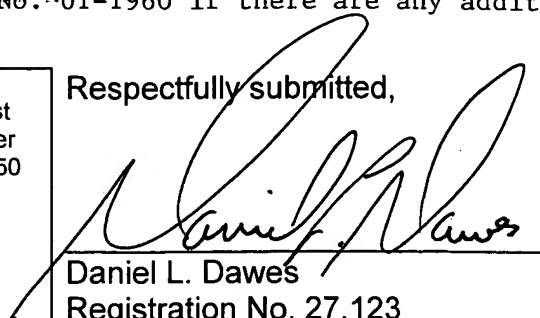
Applicant respectfully requests advancement of the claims to allowance.

Please charge Deposit Account-No. 01-1960 if there are any additional fees-----
pertaining to this case.

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Respectfully submitted,


Daniel L. Dawes
Registration No. 27,123
Myers Dawes Andras & Sherman LLP
19900 MacArthur Blvd., 11th Floor
Irvine, CA 92612
(949) 223-9600